Pre and Post Assessments of Indiana National Guard Soldiers on Cardiorespiratory Endurance

Lauren N. Dame, Nicole L. Koontz, Tonya R. Skalon, Mary T. Imboden, and Becca S. Smith
Ball State University, Muncie, IN.

Abstract

INTRODUCTION: Cardiorespiratory endurance (CRE) is a reflection of health and is related to the circulatory, respiratory, and musculoskeletal systems. Soldiers of the National Guard are expected to have sufficient CRE, however, many soldiers fail this portion of the Army Physical Fitness Test (APFT).

PURPOSE: To evaluate the success of home exercise prescriptions in improving CRE between the Indiana National Guard (ING) soldiers' pre- and post-tests.

METHODS: Participants were 21 ING soldiers (25±6y) who failed or had a history of failing a record APFT and who had completed a pre- and post-testing day ranging from spring 2015 through spring 2017. Soldiers completed a timed two-mile run, push-up and sit-up tests per APFT regulations. Additional health measures were collected or self-reported, including height, weight, resting heart rate, blood pressure, handgrip strength, sit-and-reach scores, waist and hip circumferences and 3-site skinfolds. SPSS V.24 was used to perform descriptive statistics and univariate analysis of variance to assess differences between pre- and post-assessment CRE.

RESULTS: There were no significant differences between pre- and post- tests for CRE (p=0.639). Furthermore, there were no significant differences between pre and post-tests for any of the other health parameters assessed. However, trends were observed in the desired direction according to the program's desired goal of passing the APFT; indicating minor improvement.

CONCLUSIONS: CRE is an integral part of the APFT. Although there were no significant differences found between the pre- and post-testing for CRE, there was a trend observed indicating the potential for the home-based exercise prescription program to have success. Limitations include the length of each soldiers program between pre- and post-tests and the efficacy of each soldier completing the home-based exercise prescription. Therefore future research should assess CRE improvements in soldiers of the ING over a longer follow-up period and using a method to track adherence to the exercise prescription.

Background

Pre- and post-testing utilized to evaluate the effectiveness of home-based exercise prescriptions aimed to improve soldiers' CRE scores for the APFT.

- ❖ Stage One: Pre-testing and initial exercise prescription given
- ❖ Stage Two: Improvement exercise prescription created and sent
- ❖ Stage Three: Post-testing, review of exercise since stage one
- ❖ Stage Four: Maintenance exercise prescription sent

TABLE 6.5
Aerobic (Cardiovascular Endurance) Exercise Evidence-Based Recommendations

FITT-VP	Evidence-Based Recommendation
Frequency	■ ≥5 d · wk^{-1} of moderate exercise, or ≥3 d · wk^{-1} of vigorous exercise, or a combination of moderate and vigorous exercise on ≥3–5 d · wk^{-1} is recommended.
Intensity	■ Moderate and/or vigorous intensity is recommended for most adults. ■ Light-to-moderate intensity exercise may be beneficial in deconditioned individuals.
Time	■ 30–60 min · d^{-1} of purposeful moderate exercise, or 20–60 min · d^{-1} of vigorous exercise, or a combination of moderate and vigorous exercise per day is recommended for most adults. ■ <20 min of exercise per day can be beneficial, especially in previously sedentary individuals.
Type	■ Regular, purposeful exercise that involves major muscle groups and is continuous and rhythmic in nature is recommended.
Volume	■ A target volume of ≥500–1,000 MET-min · wk^{-1} is recommended. ■ Increasing pedometer step counts by ≥2,000 steps · d^{-1} to reach a daily step count ≥7,000 steps · d^{-1} steps is beneficial. ■ Exercising below these volumes may still be beneficial for individuals unable or unwilling to reach this amount of exercise.
Pattern	■ Exercise may be performed in one continuous session, in one interval session, or in multiple sessions of ≥10 min to accumulate the desired duration and volume of exercise per day. ■ Exercise bouts of <10 min may yield favorable adaptations in very deconditioned individuals.
Progression	■ A gradual progression of exercise volume by adjusting exercise duration, frequency, and/or intensity is reasonable until the desired exercise goal (maintenance) is attained. ■ This approach of "start low and go slow" may enhance adherence and reduce risks of musculoskeletal injury and adverse cardiac events.

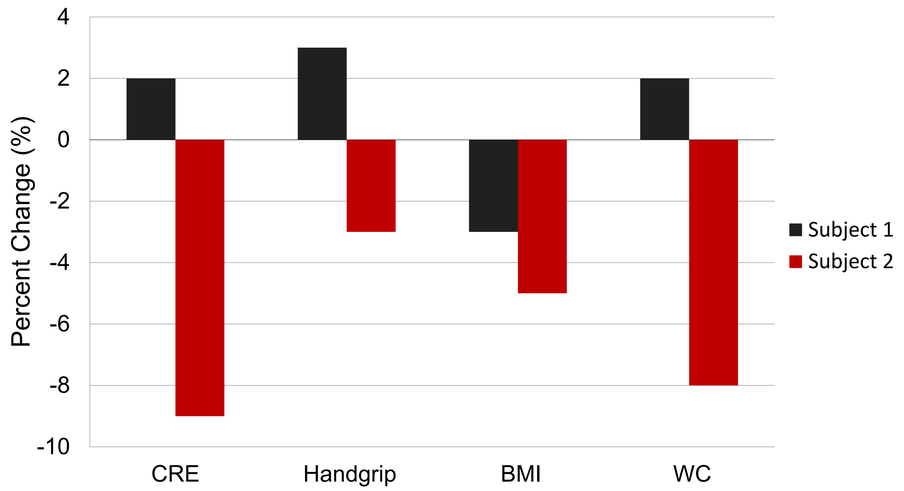
Adapted from (37).

Results: Evaluation of the Success of Home-Based Exercise Prescriptions in Improving CRE Between Pre- and Post-Tests in the ING

Subject Characteristics

Variables	Total N=42	Pre n=21	Post n=21
Age (yr)	25.6 ± 6.2	25.4 ± 6.3	25.9 ± 6.2
BW (kg)	85.2 ± 15.7	84.5 ± 15.6	86.0 ± 16.2
BMI (kg/m^2)	27.7 ± 4.0	27.5 ± 3.9	27.9 ± 4.1
CRE (min)	19.8 ± 3.1	19.9 ± 3.3	19.6 ± 2.9
Waist Circumference (cm)	89.7 ± 11.8	89.1 ± 11.4	90.3 ± 12.6
Seated HR (bpm)	76.6 ± 9.5	74.9 ± 8.7	78.3 ± 10.2

CRE Case Study



Conclusions and Summary

- ❖ Pre- and post-testing CRE values were not significantly different.
- ❖ Pre- and post-tests for CRE showed potential success from home-based exercise prescriptions.
- ❖ Soldiers' program length between pre- and post-tests varied.
- ❖ Limited by soldiers' commitment to home-based exercise program.
- ❖ Future research should encourage stricter adherence guidelines.